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OWC - 0198

4 January 1960

MEMORANDUM FOR THE RECORD

SUBJECT: OXCART Suppliers Meeting

1. On 16 December 1959 the undersigned attended an OXCART Suppliers meeting at the Pratt & Whitney plant, West Palm Beach, Florida. A summary of highlights of the meeting sessions attended by the undersigned are noted below.

2. Mr. G. L. Johnson of Lockheed reported:

a. Wind tunnel tests of the A-12 model are going well. A major change noted: the wing is at a negative angle of incidence on the fuselage.

b. High speed tunnel tests: work is proceeding on the nacelle design.

c. Basic problem still confronting Lockheed: Landing stability must be solved.

d. Personnel build-ups:

25X1A (1) By May 1961 Lockheed will have about [redacted] persons assigned to the OXCART program.

25X1A6a

(2) [redacted]

25X1A6a

(a) Lockheed will have about 24 persons, on an average, at [redacted] during the next year.

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(b) Lockheed will have about 83 persons [redacted] in March-April 1961 during the assembly and A-12 flight test period.

e. Equipment areas:

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(1) A separate written report is available on a recommended supplier, [redacted] for the inertial guidance system and autopilot.

25X1A5a1

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(2) A separate written report is available on recommended suppliers for the A-12's air conditioning system: [redacted], with the former Mr. Johnson's first choice. Mr. Johnson stated that the system should be a water system and a simple one.

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f. A revetment for fuel system tests and a small structure for component high temperature testing must be constructed at Burbank, total estimated cost \$72,000.

g. Hydraulics Pumps: Hydraulic pumps now available in the industry can be utilized with some (little) further development for the A-12.

h. Structural design of A-12:



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i. Radar cross section tests [REDACTED] are receiving major attention.

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j. Fuel estimates [REDACTED] during the operational phase are the subject of a paper by Lockheed.

25X1A

k. An immediate requirement exists at Lockheed to order [REDACTED] of titanium, steel and vasp alloy (material for 1 $\frac{1}{2}$ aircraft). This is necessary to protect Lockheed's delivery position and the OKCANT schedule.

l. A dual oxygen system, complete, has been designed for the A-12. This is a high pressure, not liquid, oxygen system.

m. Major Concerns:

(1) Radar cross section problem: determine proper material for leading edges, chines and trailing edges.

(2) Costs: In view of high costs of some components, it may be necessary to lower costs by departing from the use of the best possible items available to adequate but less expensive ones.

(3) The A-12 depends on artificial stability at landing. A spring-load aerodynamic surface has promise.

n. In response to Mr. Bissell's query concerning what major decisions will be needed in January, Mr. C. L. Johnson replied:

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- (1) A configuration freeze and go-ahead on the specific number of aircraft desired is required in order to enable Lockheed to plan and implement tooling requirements efficiently.
- (2) Basic loads to be carried in the A-12 must be identified.
- (3) A decision must be reached on who will make the ejector and gear box, etc.
- (4) The exterior configuration of basic systems must be established.

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3. [REDACTED] of Pratt & Whitney reported:

a. It is preferable from a structural point-of-view to integrate the ejector with the airframe, i.e., Lockheed be responsible for the ejector. This matter is still under study.

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b. Results of radar cross section tests involving additives in fuels are very encouraging. Thus, exhaust nozzle tests have been cancelled. When Mr. Bissell indicated concern at the cancellation of exhaust nozzle tests, [REDACTED] following day [REDACTED]

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c. Pratt & Whitney expects to have the local test facility for Mach 2 tests early January 1960.

d. Fuel specification FWA 523, the subject of a written report, was reviewed. P & W is checking with various suppliers in the industry on production and costs of this fuel.

e. P & W tentatively decided on an oil, Monsanto FL-600, which has been labeled FWA-424. The present cost of this oil is \$175 per gallon, but eventually costs will be reduced to \$50 - \$75 per gallon. The oil is reclaimable at a cost of 50¢ per gallon. The oil will operate at 600° max; below 30°F it must be warmed. [REDACTED] was given a sample of the oil to check toxicity and related hazards, if any, to personnel.

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f. 1637 test stand hours have been accumulated on J-58 engines. The fuel control parts problem remains to be solved.

g. Re J-58 noise level, P & W personnel have been working around test stand engines, utilizing only protective ear-muffs, and have not suffered any ill effects.

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h. When asked to underline troubles or problem areas, [REDACTED] enumerated the following:

- (1) Exhaust geometry requirements, if any, must be defined.
- (2) Cost problems relating to high temperature materials.
- (3) Converting units, previously aluminum, for [REDACTED] performance. However, no major problems are foreseen.

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25X1A5a1 4. [REDACTED] made the following remarks about inlet controls:
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a. Lockheed [REDACTED] agreed on a schematic for inlet controls.

b. As the inlet control system, the pilot will manually switch on, but an automatic feature is incorporated above 10,000 feet and automatic locking below 10,000 feet on descent.

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c. [REDACTED] now is about to go into^a design schedule for the inlet controls.

d. By the end of 1960, an inlet control system will be ready for delivery.

e. The hydraulic system of the inlet control system is tied into the landing gear system. Each system operates at different times.

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5. [REDACTED] of Perkin-Elmer reported on the status of the camera system as follows:

a. Recent meetings between P & E and contractors were reviewed briefly.

b. Dr. Baker recommended an alternate lens system which P & E now is evaluating in a computer. At first glance the system looks good on axis, but off axis performance is not yet determined.

c. Re camera configuration size and outside dimensions, Lockheed is aware of the basic interface requirements.

d. The heat entry problem, when the shutter is open, is under study.

e. A lower and upper hatch system will be used.

f. Problems and decision areas:

- (1) Is the proposed coverage of the camera system acceptable?

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(2) Re equipment bay:

- (a) PH prefers a bay with ambient pressure.
- (b) The cooling area between the bay and skin of aircraft is a Lockheed interface responsibility.
- (c) Optics will be at ambient pressure. Film storage will be located above the optics in a closed sealed box and the environment will be at about $\frac{1}{2}$ an atmosphere.

COMMENT: Mr. C. L. Johnson's comments on the P & E review centered around:

- a. Temperatures in the film bay.
- b. The problem of keeping windows clean.
- c. Temperature distribution.
- d. Complexity of the camera system.

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8. Mr. Bissell covered the following topics in a general OXCART review:
- a. The FY-61 OXCART budget is going well.
 - b. Soviet Air Defense posture was mentioned briefly. Also, that Soviet aircraft tracking is a most serious matter. As a result, more stress must be placed, during the operational phase, on employing tracking confusion tactics.
 - c. The next suppliers meeting, hopefully scheduled for mid-January, is a critical one in view of the radar cross-section and configuration freeze decisions.
 - d. At the next suppliers meeting, among the topics to be discussed are the following:

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- (1) Configuration freeze.
 - (2) Numbers of units, i.e., aircraft, engines, equipment, required.
 - (3) What components in the [REDACTED] aircraft will qualify for [REDACTED] performance and how close to [REDACTED] are other items or components.
 - (4) Review other systems contemplated, such as System VI and Side Looking Radar. As the latter, an all weather capability is desirable for OXCART.
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9. In [REDACTED] review of engine specifications and tests, several changes to clarify specifications were discussed and agreed upon:

- a. Engine specification No. 3967A, dated 4 September and revised 8 December, page 1, guaranteed maximum guaranteed rating, Sea Level Static ARDC condition, THPE LB/HR., should be changed from 2.3 to 2.15.
- b. In engine test stand tests, after-burning should be at 100% in 3 out of 4 test cycles.
- c. In figure #2, in above mentioned specification, the total cumulative time should be at maximum temperatures.

10. In discussing who should build the ejector, gear box and drive shaft, Mr. Bissell directed the following:

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- a. That [REDACTED] submit a proposal covering the gear box and drive shaft.
 - b. That [REDACTED] and Lockheed, each, submit a cost proposal on the ejector with and without the doors.

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11. Tours of the [REDACTED] facility were conducted and a visit to the J-58 engine run-up stands took place.

12. Special technical meetings with limited attendance occurred throughout the day, 16 December, and a special meeting pertaining to exit nozzle radar requirements was scheduled for 17 December with [REDACTED] personnel and Messrs. [REDACTED] scheduled to attend.

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2 - [REDACTED] [REDACTED]
2 - [REDACTED] [REDACTED]
1 - [REDACTED] [REDACTED]
2 - [REDACTED] [REDACTED]
3 - [REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
Distribution:

SIGNED
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